REMARKS

The Office Action dated June 29, 2007 has been read and carefully considered and the present amendment submitted in order to amend the claim language and to further point out distinctions between the present invention and the cited prior art.

In that Office Action, claims 1-2, 10, 11, 15-20, 28, 30-33, 35-37, 39-44 and 46-53 were rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement on the basis that the specification was contended to disclose only an alkali halide crystal whereas the claims were directed to simply an "infrared light transmitting crystal". Applicant disagrees with the statement that the disclosure only teaches an alkali halide crystal, however, to expedite the further prosecution of this application, the claims have all been limited to an "alkali halide crystal".

Claims 1-20, 28, 30-33, 35-37 and 39-44 and 46-53 were further rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which application regards as the invention. The grounds were whether the invention would work with any crystal or only an alkali halide crystal. It is believed that the amendments made herein to the claims limiting them to an alkali halide crystal also overcome that rejection.

Next, claims 1-2, 10, 11, 15-20, 28, 30-33, 35-37, 39-44 and 46-53 were rejected under 35 U.S. 103(a) as being unpatentable over Gagnon *et al*, U.S. Patent 5,764,355 in view of Eden *et al*, U.S. Patent 4,843,030, further in view of Applicant's admitted prior art (pages 3-8 of the original specification) or Izumi, U.S. Patent 4,932,780. Claim 45 was rejected under 35 U.S. 103(a) as being unpatentable over Gagnon *et al*, U.S. Patent 5,764,355 in view of Eden *et al*, U.S. Patent 4,843,030, further in view of Applicant's admitted prior art (pages 3-8 of the original specification) or Izumi, U.S. Patent 4,932,780 together further in view of Marker *et al*, U.S. Patent 4,855,110.

On July 31, a brief interview was conducted with Examiner Lyle to discuss whether the art of record would be overcome by limiting the claims to an "alkali halide crystal". Examiner Lyle advised that such amendment would overcome the Section 112, first paragraph, issues but did not feel that it would overcome the Eden et al and Izumi references. Mr. Lyle further noted that the limitations directed to forming the cuvette (the crystal) by cleaving, fly cutting etc. are product by process subject matter and in the absence of a showing that a different product is created by those actions, those limitations would not further limit the pending device claims.

Applicant disagrees with the Eexaminer's statement that the limitations directed to forming the cuvette (sic) by cleaving, fly cutting etc (hereinafter "cleaving") are product by process subject matter because no showing has been made that a different product has been created by cleaving. It is well settled in the field of optics that even small nuances in processing can create different products. A simple example is that an alkali halide crystal optic polished to a flatness of 10 λ with an 80/50 scratch/dig is not a CO_2 laser window while one polished from the same material to 1/10 λ with a 40/20 scratch dig is a CO_2 laser window. Both are windows; both are made from the same material; both transmit light, both are processed by grinding and polishing means, but the nuances of the polishing process makes one optic a completely different product from the other because the optic polished to less precise specifications is simply unsuited to use with a laser while the less precisely polished window may be suitable for spectroscopic applications.

The specification and Dr, de Haseth's statement extensively differentiate windows formed by cleaving from those formed by other means. For example, cleaved alkali halide windows are different from blanks due to their IR light transmission properties. As Dr. de Haseth stated, blanks cannot be used for spectroscopic sampling without first polishing them due to the inadequate IR light transmission of blanks (paragraph 2a, De Haseth Statement). Cleaved alkali halide windows transmit in excess of 80% of the available energy emitted by an FTIR spectrophotometer. Specification, Page 15, line 24 to page 16, line 2. As shown in Figures 8, 9 and 10 as compared to Figures 3A, 4A and 5A, cleaved alkali halide windows have vastly superior IR light transmission to blanks. Since a blank is not useful for spectroscopic

analysis without further processing, whereas a cleaved alkali halide window is suitable, they are different products with different performance characteristics and the process by which the windows are produced is what creates the difference in light transmission which makes them a different product.

Similarly, the cleaving process also creates an alkali halide window with properties that are in some respects superior to those of a polished window made from the same materials. Polished alkali halide widows are, as stated in Izumi, deliquescent. Izumi, Col 2, line 37. The specification shows that cleaved alkali halide windows are resistant to atmospheric moisture whereas polished alkali halide windows absorb atmospheric moisture. Page 16, lines 7-12. The cleaving process therefore results in a product which is differentiated in material physical respects from a substrate prepared by polishing. Because cleaved alkali halide windows do not absorb atmospheric moisture, they can be packed, stored and handled with much less care then polished alkali halide windows. The cleaved windows do not have to packed and stored with desicant and can be used in rooms that are not climate controlled. These properties make the cleaved alkali halide window uniquely suitable for use as a substrate in an IR sample card.

Again, it is submitted that the Gagnon *et al* reference is simply not a viable principle reference against the present claims and cannot be combined with the secondary references of Eden *et al* or Izumi in order to render the present claims unpatentable. Gagnon *et al* discloses a porous screen and its deficiencies as a substrate for holding a sample are well documented in the Statement of Dr. de Haseth as well as in the specification. Note page 4, beginning at line 10, the discussion concerning the use of mesh screen cards and the difficulties in maintaining a sample on the card, the reduction in energy available in the transmission of the energy of the spectrophotometer. In Gagnon *et al*, the screen material is largely irrelevant since the IR energy used for an analysis is directed through the material that is held within the voids of the screen and not thorough the screen material. The screen material is used to simply hold the material such that the IR energy passes through the material in the voids of the screen and not on the screen material itself.

The Examiner has, in the Office Action, stated that Gagnon *et al* teach that the holder

material can be glass, quartz etc. Again, Applicant stresses that "glass, quartz or polymeric materials" are not infrared transmitting materials. They all absorb infrared energy and there is no statement in Gagnon *et al* that these materials are infrared transmitting materials. The difference is that in Gagnon *et al*, as stated, the material for the screen doesn't need to be an infrared transmitting material since the IR energy is actually passing through the voids in the screen and the analysis does not rely on the infrared energy actually passing through the material used to construct the screen.

The only reference in Gagnon *et al* to an infrared transmitting material is in relation to a "protective cover that is transparent to IR light" (col. 5, line 2). There is no reference anywhere in Gagnon *et al* to the need for the sample supporting substrate to be an infrared transmitting material, nor is such a material disclosed in Gagnon *et al*.

In addition, it is submitted that the receiving means of Gagnon *et al* must be porous. Note the declaration of Dr. de Haseth on that point and which is not a legal conclusion but a statement as to the physical property of the screen of Gagnon *et al* by a renown expert in the field. Note the extensive CV of Dr. de Haseth. See paragraph 5 of the de Haseth statement, "While the polymer and screen cards previously discussed are porous and must be porous, a crystal processed in accordance with claim 1 language is not porous". (underlining added)

Applicant's substrate is not a porous screen but instead is comprised of a alkali halide crystal material produced by very specific steps defined in the claims and the material allows infrared light to pass therethrough without the infrared light transmitting sample supporting substrate or any other material within the aperture substantially absorbing infrared light within a substantial portion of the infrared spectral range. As stated by Dr. deHaseth, the alkali halide crystal of the present invention is not porous and the sample material therefore is applied to the substrate itself and not to voids in that substrate. With such arrangement, it is thus imperative that the substrate material allow infrared energy to pass therethrough since, if not, the eventual analysis would be affected by the absorption of the infrared light by the substrate.

Applicant reiterates the basic difference between the grid type of screen of Gagnon *et al*

and a crystal of the present invention produced by very specific steps. A "crystal" has previously been defined by Applicant by submitting various well recognized definitions thereof and which clearly distinguishes the present crystal over a screen having a grid pattern similar to a window screen that simply cannot be produced by cleaving, fly cutting, chipping milling or scaling. Note also, the attached statement of Dr. Smolyarenko, paragraph 9, "It is well known in the field of crystal growth and optics that a crystal is a solid and that a crystal is not porous."

The differences between the use of a screen where the material is spread over the screen such that the material to be analyzed is trapped within the voids and the use of a crystal surface where the sample material is spread evenly over the surface is profound. With a screen, if the material is not sufficiently viscous, it will not adhere to the screen material and, therefore, certain materials simply cannot be analyzed with the use of a screen. This is an inherent limitation of a screen used to hold and position the sample material to be analyzed that is not an issue with the use of a crystal material.

Accordingly, there is a real physical difference between the physical properties of the receiving means of Gagnon *et al* and the present alkali halide crystal. Simply put, and as clearly recited in the claim language, the former is a screen that must be porous and the latter is an alkali halide crystal that is not porous.

The secondary reference of Eden *et al* relates to the processing of a semiconductor and its disclosure relative to cleaving is embodied in a single statement " the NaCl substrates were prepared by cleaving large crystals in argon" Eden, Col. 10, line 54-55.

There is no logical combination of Gagnon *et al* and Eden *et al* since Gagnon *et al* teaches the use of a screen as a receiving means and Gagnon *et al* makes only that rather obscure reference to the cleaving of large crystals. It is clear that neither reference has any relation to or disclosure of the use of an alkali halide crystal as a substrate for holding a sample for spectroscopic analysis. There is nothing in Eden *et al* that would be combinable with Gagnon *et al* to illustrate the use of an alkali halide crystal used to achieve the transmission of

infrared radiation since the substrate in Eden *et al* is not even contacted by the infrared radiation.

Turning finally to Izumi, the reference adds to the statement of Dr. De Haseth to the effect that polishing a crystal is a tedious and expensive process. Dr. de Haseth agrees, "Blanks, which were sold in unpolished form were unsuitable for spectroscopic analysis unless and until they were polished. It was also common for practicing spectroscopists to know how to polish alkali halide windows. This is a time consuming process and it is a skill that has almost been totally lost to the average spectroscopy lab." (Paragraph 2a, de Haseth Statement}.

The Examiner has drawn only an inference from the Izumi reference in the statement:

"Izumi teach [sic] in column 2 lines 24+ polishing KBr crystal is expensive and high polishing is needed for wavelengths ***other than the infrared range"***

That statement is thus used to conclude that Izumi implies that high polishing is not needed for the IR range. As previously stated, however, that is not the teaching of Izumi. Izumi states that:

"For the intermediate infrared region, they [beam splitters] are generally made from very expensive KBr single crystal. The surfaces of the substrate and the correcting plate must be optically polished; however, the polishing cost is considerable because a KBr crystal is relatively soft and deliquescent" Izumi, Col 2, lines 31 -37.

It is quite clear that Izumi teaches that processing KBr for IR applications involves polishing, not just cleaving or cutting etc.

Therefore, the only logical conclusion to be drawn from Izumi is that the known state of the art for processing crystal material such as KBr is that it must be polished and that that polishing is expensive. As such, the combination of Gagnon *et al* and Izumi is not viable. Gagnon *et al* teaches the use of a screen, similar to a window screen, and Izumi teaches that the

polishing of a crystal is laborious and very expensive. There is, therefore, no connection that can combine the disclosures of the references.

Accordingly, it is submitted that the claims currently in the present application are in allowable form over the references of record and an allowance of the present application is respectfully solicited.

Respectfully submitted,

Roger M. Rathbun

Attorney for Applicant